What is claimed is:

1. A method for nondestructively and quantitatively evaluating aged deterioration of evaluating ferromagnetic construction materials, the steps of comprising:

an evaluation information acquiring step of obtaining a stress-strain relation in advance by a tensile test with respect to a test piece which is made of the same evaluating ferromagnetic construction material (evaluating material), evaluating a minor hysteresis loop (reference minor loop) of the test piece while applying an applied stress (σ) thereto, the applied stress (σ) being appropriately determined according to the stress-strain relation, and obtaining correlation between physical quantities for evaluating aged deterioration of the evaluating material;

a measurement step of obtaining a subject minor hysteresis loop (subject minor loop) by a tensile test with respect to the evaluating material and obtaining measured values of said physical quantities from the loop;

an evaluation step of evaluating aged deterioration of the evaluating material from said measured values of said physical quantities obtained in the measurement step, according to said correlation between said physical quantities obtained in the foregoing evaluation information acquiring step:

the minor hysteresis loops are obtained with respect to each the magnetic field amplitude (H_a) of the intensity (H) of the magnetic field from the relation between said intensity (H) and the magnetic flux density (B), the relation is obtained by measuring said magnetic flux density (B) of a measuring object with changing in stage a magnetic field applying to the measuring object.

2. A method as described in Claim 1 for nondestructively evaluating aged deterioration of evaluating ferromagnetic construction materials wherein:

said correlation between physical quantities includes the first relation of the relation between the pseudo coercive force (Hc*) and magnetic field amplitude (H_a) applied to the measured object, the pseudo coercive force (Hc*) being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the second relation of the relation between the reciprocal ($1/\chi_H$*) of the pseudo susceptibility (χ_H*) being the gradient of a reference minor hysteresis loop at the point where the magnetic field intensity (H) is equal to the pseudo coercive force (Hc*) and magnetic field amplitude (H_a); and

the physical quantities obtained via said measurement step comprise the pseudo coercive force (Hc*) being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the reciprocal ($1/\chi_H$*) of the pseudo susceptibility (χ_H*) being the gradient of said subject minor hysteresis loop at the point where the magnetic field intensity (H) is equal to the pseudo coercive force (Hc*).

3. A method as described in Claim 2 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

in said evaluation data obtaining step, the third relation of the relation between the reciprocal ($1/\chi_H$*) of pseudo susceptibility (χ_H*) and the pseudo coercive force (Hc*), is obtained from said first relation and said second relation; and

said evaluation step comprises evaluating aged deterioration of said evaluating ferromagnetic construction material from the third relation.

4. A method as described in Claim 2 or 3 for nondestructively evaluating aged deterioration of a ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the fourth relation of the relation between the reciprocal of susceptibility ($1/\chi_H$*) and the applied stress (σ) at a predetermined pseudo coercive force (Hc*) from the first, second or third relation; and

the evaluation step comprises evaluating aged deterioration of the evaluating material based on the fourth relation.

5. A method as described in Claim 1 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

said correlation between physical quantities includes the first relation of the relation between the pseudo coercive force (Hc*) and magnetic field amplitude (H_a) applied to the measured object, the pseudo coercive force (Hc*) being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the fifth relation of the relation between the pseudo hysteresis loss (W_F*) and magnetic field amplitude (H_a), the pseudo hysteresis loss (W_F*) being defined as an area enclosed by a reference minor hysteresis loop; and

the physical quantity data obtained via the measurement step includes the pseudo coercive force (Hc*) which is the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the pseudo hysteresis loss (W_F*) which is an area enclosed by said subject minor hysteresis loop.

6. A method as described in Claim 5 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the sixth relation of the relation between said pseudo hysteresis loss (W_F*) and said pseudo coercive force (Hc*) from the first and fifth relations; and

said evaluation step comprises evaluating aged deterioration of the evaluating material from the sixth relation.

7. A method as described in Claim 5 for nondestructively evaluating aged

deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the seventh relation of the relation between the pseudo hysteresis loss (W_F*) and an applied stress (σ) at a predetermined pseudo coercive force (Hc*) from the first and fifth relations or the sixth relation; and

said evaluation step comprises evaluating aged deterioration of the evaluating material from the seventh relation.

8. A method as described in Claim 1 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the correlation data between relevant physical quantities includes the first relation of the relation between the pseudo coercive force (Hc*) and magnetic field amplitude (H_a) applied to the evaluating material, the pseudo coercive force (Hc*) being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, the eighth relation of the relation between the pseudo remanence (Br*) and magnetic field amplitude (H_a), the pseudo remanence (Br*) being the magnetic flux density (B) at the point where the magnetic field intensity (H) becomes zero, and the ninth relation of the relation between the reciprocal ($1/\chi_R$*) of pseudo remanence susceptibility (χ_R*) and magnetic field amplitude (H_a), the pseudo remanence susceptibility (χ_R*) being the gradient of a reference minor hysteresis loop at the point where the magnetic flux density (B) is equal to the pseudo remanence (Br*); and

the physical quantity data obtained via the measurement step includes the pseudo coercive force (Hc*) or the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, the pseudo remanence (Br*) or the magnetic flux density (B) at the point where the magnetic field intensity (H) becomes zero, and the reciprocal of pseudo remanence susceptibility ($1/\chi_R$*), the pseudo remanence susceptibility (χ_R*) being the gradient of a subject minor hysteresis loop at the point where the magnetic flux density (B) is equal to the pseudo remanence (Br*).

9. A method as described in Claim 8 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the tenth relation of the relation between the pseudo remanence (Br*) and the pseudo coercive force (Hc*) from the first and eighth relations; and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the tenth relation.

10. A method as described in Claim 9 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the eleventh relation of the relation between the pseudo coercive force (Hc*) at predetermined pseudo remanence (Br*) and an applied stress from the tenth relation; and

the eleventh relation is used for evaluating aged deterioration of the evaluating material.

11. A method as described in any one of Claim 7, 8, 9, or 19 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the twelfth relation of the relation between the pseudo remanence (Br*) and the reciprocal ($1/\chi_R$*) of pseudo remanence susceptibility (χ_R*) from the eighth and ninth relations, the pseudo remanence (Br*) being the magnetic flux density (B) at the point where the magnetic field intensity (H) being zero, and the pseudo remanence susceptibility

(χ_R*) being the gradient of a reference minor hysteresis loop at the point where the magnetic flux density (B) is equal to the pseudo remanence (Br*); and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the twelfth relation.

12. A method as described in Claim 8 for nondestructively evaluating aged deterioration of a test ferromagnetic construction material wherein:

the evaluation information acquiring step comprises obtaining the thirteenth relation or the relation between the reciprocal of pseudo remanence susceptibility ($1/\chi_R$*) at a predetermined pseudo remanence (Br*) with an applied stress (σ) from the eighth and ninth relations or the twelfth relation;

the evaluation step comprises evaluating aged deterioration of the evaluating material from the thirteenth relation.

13. A method as described in Claim 1 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the correlation data between relevant physical quantities includes the first relation of the relation between the pseudo coercive force (Hc*) and magnetic field amplitude (H_a) applied to the evaluating material, the pseudo coercive force (Hc*) being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the fourteenth relation of the relation between pseudo remanence work (W_R*) and magnetic field amplitude (H_a), the pseudo remanence work (W_R*) being defined as a fraction of an area enclosed by a reference minor hysteresis loop; and

the physical quantity data obtained via the measurement step includes the pseudo coercive force (Hc*) and the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the pseudo remanence work (W_R*) and a fraction of an area enclosed by a subject minor hysteresis loop.

14. A method as described in Claim 13 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the fifth relation of the relation between the pseudo remanence work (W_R*) and the pseudo coercive force (Hc*) from the first and fourteenth relations; and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the fifth relation.

15. A method as described in Claim 13 or 14 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation step comprises obtaining the sixteenth relation of the relation between the pseudo remanence work (W_R*) at a predetermined pseudo coercive force (Hc*) and an applied stress (σ) from the first and fourteenth relations or the fifteenth relation; and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the sixteenth relation.

16. A method as described in Claim 1 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the correlation data between relevant physical quantities includes the first relation of the relation between the pseudo coercive force (Hc*) and magnetic field amplitude (H_a) applied to the material, the pseudo coercive force being the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the seventeenth relation of the relation between the reciprocal ($1/\chi_a$*) of pseudo susceptibility (χ_a*)at magnetic field amplitude (H_a) and magnetic field amplitude (H_a), the pseudo susceptibility at magnetic field amplitude (χ_a*) being the gradient of a reference minor hysteresis loop at magnetic field amplitude (H_a); and

the physical quantity data obtained via the measurement step includes the pseudo coercive force (Hc*) and the magnetic field intensity (H) at the point where the magnetic flux density (B) is zero, and the reciprocal of pseudo susceptibility at magnetic field amplitude($1/\chi_a^*$), the pseudo susceptibility (χ_a^*) being the gradient of a subject minor hysteresis loop at magnetic field amplitude (H_a).

17. A method as described in Claim 16 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the eighteenth relation of the relation between the reciprocal ($1/\chi_a^*$) of pseudo susceptibility (χ_a^*) at magnetic field amplitude (H_a) and the pseudo coercive force (Hc*) from the first and seventeenth relations; and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the eighteenth relation.

18. A method as described in Claim 16 or 17 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the nineteenth relation of the relation between the reciprocal ($1/\chi_a^*$) of pseudo susceptibility (χ_a^*) at magnetic field amplitude (H_a) and an applied stress (σ) from the first and seventeenth relations or the eighteenth relation; and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the nineteenth relation.

19. A method as described in Claim 6 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the seventh relation of the relation between the pseudo hysteresis loss (W_F*) and an applied stress (σ) at a predetermined pseudo coercive force (Hc*) from the first and fifth relations or the sixth relation; and

said evaluation step comprises evaluating aged deterioration of the evaluating material from the seventh relation.

20. A method as described in any one of Claim 7, 8, 9, or 19 for nondestructively evaluating aged deterioration of an evaluating ferromagnetic construction material wherein:

the evaluation data obtaining step comprises obtaining the twelfth relation of the relation between the pseudo remanence (Br*) and the reciprocal ($1/\chi_R$*) of pseudo remanence susceptibility (χ_R*) from the eighth and ninth relations, the pseudo remanence (Br*) being the magnetic flux density (B) at the point where the magnetic field intensity (H) being zero, and the pseudo remanence susceptibility (χ_R*) being the gradient of a reference minor hysteresis loop at the point where the magnetic flux density (B) is equal to the pseudo remanence (Br*); and

the evaluation step comprises evaluating aged deterioration of the evaluating material from the twelfth relation,

wherein:

the evaluation information acquiring step comprises obtaining the thirteenth relation or the relation between the reciprocal of pseudo remanence susceptibility ($1/\chi_R$*) at a predetermined pseudo remanence (Br*) with an applied stress (σ) from the eighth and ninth relations or the twelfth relation;

the evaluation step comprises evaluating aged deterioration of the evaluating material from the thirteenth relation.